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AZ CORP COMMISSION
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March 28, 2002

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1200 W. Washington
Division: Hearing
Phoenix, AZ 85007

Re: APS Request for a Variance
Generic Docket on Electric Restructuring

E-00000A-02-0051
E-01345A-01-0822
E-00000A-01-0630
E-01933A-02-0069
E-01933A-98-0471

Dear Ms. Cole:

Enclosed for filing in the above-captioned proceedings are the original and ten copies of the testimony of Peter Chamberlain, witness for the Arizona Cogeneration Association, in the above captioned dockets.

Please let me know if you have any questions. I can be reached at 602-371-1333.

Sincerely,

Robert Baltes
President
Arizona Cogeneration Association

Enclosure

Arizona Corporation Commission
DOCKETED

MAR 28 2002

DOCKETED BY

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BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL

Chairman

JIM IRVIN

Commissioner

MARC SPITZER

Commissioner

IN THE MATTER OF THE GENERIC
DOCKET FOR ELECTRIC RESTRUCTURING

DOCKET NO. E-00000A-02-0051

IN THE MATTER OF ARIZONA
PUBLIC SERVICE COMPANY'S
REQUEST FOR A VARIANCE OF
CERTAIN REQUIREMENTS OF
A.A.C. R14-2-1606

DOCKET NO. E-01345A-01-0822

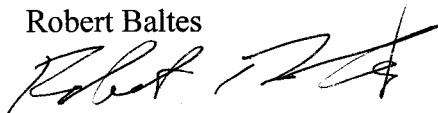
1. The Arizona Cogeneration Association (d.b.a. Distributed Energy Association of Arizona) provides the attached testimony of Peter Chamberlain, witness for the Arizona Cogeneration Association, in the above captioned dockets.

2. The Arizona Cogeneration Association requests that all pleadings, correspondence, discovery, and other documents be served on the following:

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Respectfully submitted this March 28, 2002.

Robert Baltes



President

Arizona Cogeneration Association

BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL

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JIM IRWIN

Commissioner

MARC SPITZER

Commissioner

**IN THE MATTER OF ARIZONA
PUBLIC SERVICE COMPANY'S
REQUEST FOR A VARIANCE OF
CERTAIN REQUIREMENTS OF
A.A.C.R14-2-1606**

Docket No. E-01345A-01-0822

Testimony of Peter F. Chamberlain

On behalf of the

Arizona Cogeneration Association

March 28, 2002

Q. Please state your name and affiliation.

A. My name is Peter F. Chamberlain, dba Chamberlain Energy Consulting. My office address is 215 East 79th Street, New York, NY. I am representing the Arizona Cogeneration Association in this proceeding.

Q. Please state your background and expertise.

A. I have worked in energy-related fields for over 20 years. I have been employed by Stone & Webster Engineering Corporation, Westvaco Corporation and BOC Gases Company. I am currently an independent energy consultant, working primarily in the development of competitive wholesale electric markets and the creation of standardization efforts for the interconnection and operation of distributed resources, including technical, contractual and process standards and the development of appropriate rates for standby service.

I have testified in many state regulatory proceedings in California, West Virginia, Virginia, Maine, Maryland. I have testified before the FERC on several occasions and before the Energy Subcommittee of the US House of Representatives.

I have represented distributed resources in almost all of the state activities on interconnection standardization, including New York, Texas, Delaware, West Virginia, California, New Jersey and in the recent and successful negotiation in Nevada. Nevada stands now as the first state to have agreed to adopt the imminent national IEEE standard IEEE 1547 for interconnections of generation of 10 MWs and below. I was invited by the California Energy Commission to testify at its kick-off hearing of its interconnection standardization proceeding in December of 1999. (Docket No. 99-DIST-GEN(2))

I have actively participated on behalf of distributed resources in the development of wholesale market mechanisms that accommodate market entry for distributed generation and other demand responsive resources into the wholesale markets. These include the FERC ANOPR on standard interconnection policies as well as the upcoming proposed rulemaking on market designs and market mitigation.

I hold a Bachelor of Science Degree in Electrical Engineering from Clarkson College of Technology and an MBA Degree from the Wharton School of the University of Pennsylvania.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address some of the questions enumerated by the Commissioners, particularly, questions related to distributed generation, demand response, and the need to plan for their market participation at the very beginning of market design.

- Q. Why is it important to create and maintain a viable demand responsive marketplace?

Experience elsewhere in the United States indicates that demand responsiveness, including customer choice and demand reductions made possible by cost-effective distributed generation, can have a significant, beneficial effect on the wholesale cost of electricity.

In recent proceedings at the Federal Energy Commission (FERC), there was almost universal agreement on the need for demand responsiveness at the wholesale level, including the response of customer on-site generation. It is viewed by some as the most important form of market power mitigation and market discipline.

Competitive markets require an accurate communication of market value (often referred to as "price transparency") to the consumer. In the case of electric energy markets, the market value is most often represented by the cost of electricity on an hourly basis – either on a forward basis or in real time.

- Q. Do most retail electric customers "see" these hourly market price signals?

- A. No. Most customers react to pricing done either on a monthly basis or a time-of-use period basis, such as peak hours during the day. These prices usually reflect historical prices and may be "trued up" at a later point in time and are "settled" up with customers prospectively – sometimes a year later. This kind of pricing prevents the customer from realizing what the real value of the electricity he is consuming is and, importantly, what it might be worth to the utility or other provider for him NOT to consume the next kilowatt-hour. Thus, the customer will almost certainly pay more or less than the true cost or value of the energy he is consuming. This is inefficient from a market perspective and ultimately results in higher prices for consumers.

- Q. Are demand side resources, such as distributed generation, important to the development of a competitive market for electricity?

- A. Yes, and this is not just my opinion. In its recently issued Working Paper on Standardized Transmission Service and Wholesale Electric Market Design (Docket No. RM01-12-000, issued in March 2002), the Federal Energy Regulatory Commission has concluded that demand response options are essential to a standardized market design and should be incorporated into virtually every market now served by generation.

- Q. Please explain why it is important to consider and include demand resources from the beginning of a market transformation?

- A. From a practical systems standpoint, it may be impossible to adequately “patch-in” demand response at a later date because software and hardware for the systems lack the versatility and “robustness” to accommodate the volume of possible transactions including millions of potential “negawatt” suppliers if they were designed around a generation-only scenario. This was a significant issue at the beginning of New York’s Day-ahead Bidding program for loads.

In addition, the presence of a viable demand side market significantly reduces the need to create market-distorting mitigation measures, designed to protect consumers from the exercise of market power and withholding. I would argue that it is better to build competitiveness into the market from the start, rather than apply clumsy and often ineffective mitigation measures as a substitute.

- Q. Can distributed generation participate efficiently in current wholesale or retail markets?

- A. There are very limited, meaningful wholesale market options. Distributed generation, as a primary means to produce demand responsiveness, faces many barriers in addition to the lack of price transparency discussed above. Interconnection costs and the lack of interconnection standardization, along with unreasonable standby charges, rank as primary obstacles to commercialization of distributed generation. This denies consumers the kind of cost-effective market choices that are needed to provide for truly competitive markets.

- Q. Can relatively small amounts of demand responsiveness and DG have a measurable impact on electric prices?

- A. Yes. Based on empirical studies done in New York, small amounts of demand resources, such as DG, can have and have had a significant depressing effect on the marginal price of electricity in wholesale markets. The degree of the effect will vary as a function of a number of factors, including tightness of supplies, generation mix, and transmission constraints. APS’s reserve margin is projected to be significantly below other regions in the U.S.. This relatively short supply of operating and non-spinning reserves is likely to produce large increases in marginal hourly energy prices as load approaches available capacity resources in a competitive hourly market.

The lack of price transparency to the ultimate consumer and the lack of appropriate market mechanisms make informed economic decisions about electric use impossible. This in turn discourages demand responses to electric pricing, such as on-site distributed generation and load management. Moreover, the unreasonably high market entry cost of distributed generation, including overly burdensome interconnection requirements and unreasonable back-up rates of on-site generation, seriously undermines the development of these cost efficient demand options. This Commission should move aggressively to remove barriers

to market entry for distributed resources, as well as other demand response measures.

Distributed generation and other forms of demand responsiveness provide essential market discipline over supply. Recent studies performed by Neenan & Associates, report very significant positive impacts on wholesale market prices. In a specific region of New York State, the Neenan report concluded that the participation in an emergency response program of just over 3% produced a reduction of almost 29% in the real time locational marginal price of energy over a 23 hour period. It is my opinion that the pricing provisions in the proposed PPA would virtually preclude the kinds of energy price reductions verified in New York. (Source: NYISO PRL Program Evaluation: Executive Summary, available on the NYISO Web Site.)

Q. Can you please elaborate on the Neenan study performed for the New York Independent System Operator (NYISO).

A. Yes. However, it is important to have some familiarity with the markets in New York.

Wholesale prices for electricity are determined through day-ahead and real time markets on an hourly basis. Generation is matched with load to determine clearing prices given the physical flows and constraints of the system. In addition to traditional generation, loads may also bid in energy – negawatt-hours – in the day-ahead markets. In this program, the negawatt-hour bid can set the marginal price. Loads may also sell its “installed capacity” (negawatts) if it is prepared to curtail load by or down to a certain amount. Finally, loads may participate in an emergency demand response program when system reserves become tight and are paid based on the real time energy price.

Q. Did the Neenan report evaluate the impact of these programs?

A. Yes. The report looked at the all of the pricing regions of New York during the heat wave that hit the Northeast last August. The analysis looked at actual market prices during a period when distributed generation and other demand responsive loads were participating. In addition, Neenan reconstructed what the price would have been without these resources. The difference in marginal hourly pricing was striking. The report concluded that decreases in locational based marginal cost pricing of almost 29% occurred – this despite the fact that the total amount of MWs made available from loads was just a small proportion of the total load in the area.

Q. Have you reviewed the proposed Purchase Power Agreement between Pinnacle West and APS?

A. Yes, I have.

Q. As you understand them, are the terms of the PPA consistent with competitive markets or market rules in any of the ISOs in the Northeast?

A. No, they are not. First, the PPA appears to guarantee that Pinnacle recover all of its fixed costs plus a built in profit – with little penalty for poor or non-performance. A generator selling in the Northeast has no such guarantee of such recovery and faces substantial penalties for non-performance as well as prospective reductions in the value of its capacity.

Second, electric energy prices are determined on an hourly basis and the system is dispatched according to price and transmission constraints. The PPA appears to have an all-hour price that has some adjustment mechanisms for fuel costs and the cost of Pinnacles' inability to deliver, such as the cost of replacement power when its capacity is forced out of service. Thus hourly price signals cannot be communicated to the consumer. (Perversely, this all-hour pricing actually creates a disincentive for Pinnacle to operate high cost units during peak periods inasmuch as it would be selling energy to APS at a price below its costs.)

Fixed-price contracts, like the one being proposed by APS distort market prices and prevents customers from making economic decisions because it does not rely on marginal energy prices – either short or long term – to allocate resources optimally. I view the PPA as a significant transfer of risk from Pinnacle – an unregulated entity – to ratepayers. It will have the affect of reducing or even eliminating any opportunity for a robust wholesale electric market to develop. The PPA essentially creates an unregulated monopoly at the expense of real competition.

Q. Does the PPA provide more system reliability to the system than demand responsiveness and DG?

A. I would argue quite the opposite. In fact, the PPA conveys the authority to establish the level of generating and demand-side reserves to Pinnacle, seemingly out from under any influence by this Commission and, perhaps, even FERC. This seems to create the possibility that an agency having authority could - subsequent to the execution of the PPA - set reserve levels above those deemed appropriate by Pinnacle (in its sole discretion), with the cost of those additional reserves falling upon consumers' shoulders to bear.

In the NYISO, a body independent of the NYISO establishes the required level of reserves.

In my opinion, the PPA provides no more reliability of supply than other reasonable market mechanisms that reward market participants when they perform and penalizes them when they don't. Distributed generation and other

demand response mechanisms have provided system capacity and energy reliably and have provided significant economic value in New York and elsewhere.

Empirical evidence from New York suggests that competitive wholesale markets improve reliability rather than degrade it. If a generator must operate in order to be compensated, it has a very strong incentives to maintain high operating availabilities. As evidence of that, the forced outage rates for Con Ed's generating units in New York City for the three years just prior to Con Ed selling them averaged 21.95%. In contrast, the forced outage rate for the same units over a two year period following the sale of the units (and after the startup of the NYISO) averaged 6.59%. (The 21.95% figure and the 6.59% figure were filed by the NYISO with FERC on July 6, 2001 and February 11, 2002, respectively in Docket No. ER01-2536 -000.)

Two or three years of data may not completely represent how well certain units were operated versus another period. However, this alone cannot explain the magnitude of the difference in forced outage rates.

- Q. Do you believe that the PPA pricing is consistent with what would be possible in a competitive market?
- A. No. The pricing provisions of the PPA appear to be in excess of what a competitive wholesale market in Arizona might produce.

The facilities charge alone appears to translate into an annual carrying cost of over \$160 per kw. (\$63,600,000 per month times 12 months divided by the 4720 MW minimum commitment being made by Pinnacle in Section 3.2.3 of the Service Schedule of the PPA) At an annual carrying charge rate of 15%, this would suggest that this annual per kw charge could support an investment of almost \$1100 per kw of capacity. Moreover, that charge will increase in later years according to the terms of the PPA

The equivalent capacity cost in New York State – outside of New York City – was less than \$24 per kw for the 12 months ending in April 2002. If you apply APS's load factor to the New York State capacity value of \$24 per kw (excluding New York City and Long Island capacity prices) the resulting per MWH capacity cost in New York State is less than \$5.40 per MWH. (APS's 51% load factor is specified in Section 3.1.1 of the PPA's Service Schedule is also consistent with Pinnacle's financial reporting in its 2000 Statistical Report).

The average monthly locational marginal cost for energy for the 12 months ending in February 2002 in New York State was less than \$39 per MWH – including energy pricing in New York City. (NYISO's President's Report to the NYISO Management Committee on March 7, 2002, Page 4-B, available on the NYISO Web site.)

Thus, average pricing in New York might reasonably be expected to be less than \$45 per MWH (\$39 + \$5.40) on an annual basis. (In fact, marginal energy pricing in New York State over the last 6 months has dropped to an average of just over \$28 per MWH, compared to the 12 month average of \$39 per MWH.)

Q. How do New York prices compare with the pricing in the PPA?

A. As I understand the pricing provisions of the PPA, they would produce average pricing of about \$48.00 per MWH (for capacity + energy) as enumerated in APS's October 18, 2002 filing with this Commission in Docket No. E-01345A-01-0822. This compares with actual pricing in New York of \$45 per MWH.

As a result, it appears that electric pricing in Arizona is likely to exceed pricing even in New York State.

I believe the proposed PPA will seriously jeopardize the development of any meaningful competition on the APS system.

Q. Does this conclude your testimony?

A. Yes, it does.

CERTIFICATE OF SERVICE

I hereby certify that the original and 10 copies of the TESTIMONY OF PETER CHAMBERLAIN, WITNESS FOR THE THE ARIZONA COGENERATION ASSOCIATION, IN DOCKET NO. E-1345A-01-0822 – APS REQUEST FOR A VARIANCE AND IN DOCKET NO. E-00000A-02-0051 – GENERIC DOCKET ON ELECTRIC RESTRUCTURING were filed with Docket Control, Arizona Corporation Commission, 1200 W. Washington Street, Phoenix, AZ 85007, on the 28th day of March 2002, and a true and correct copy was sent by U.S. mail, first-class and postage prepaid, to each of the following.

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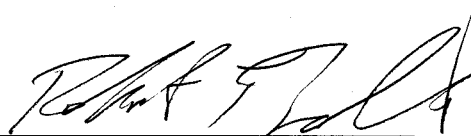
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